Real time observation of CO_2 capture at high temperature of EM-promoted MgO- based sorbents

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MgO-based adsorbent promoted by eutectic mixture (EM) has been proposed for CO_2 capture at high temperatures. EM can promote the adsorption performance due to the strong solvation effect. However, as the adsorption progresses, the CO_2 adsorption capacity of EM-MgO decreases. In this study, EM-MgO-Al_2O_3 adsorbents with optimized Mg / Al molar ratio were prepared and in-situ Transmission Electron Microscopy (TEM) was used to observe adsorption phenomena. The mechanism of the surface change at the gas-solid interface at the adsorption-regeneration reaction of the adsorbent was investigated by using in situ TEM. This study was supported by the Korea Research Foundation (NRF) sponsored by the Ministry of Science and Technology, the Information and Communication Technology Promotion Fund, and the Future Plan (NRT-2016R1C1B2008694)